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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/552,761

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Stefan Eckart

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ATI TECHNOLOGIES, INC.

C/O VEDDER PRICE KAUFMAN & KAMMHOLZ, P.C.

222 N.LASALLE STREET

CHICAGO, IL 60601

EXAMINER

REKSTAD, ERICK J

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/552,761	Applicant(s) ECKART, STEFAN	
	Examiner Erick Rekstad	Art Unit 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-8, 11-22, 24, 25, 27 and 30-33 is/are pending in the application.
- 4a) Of the above claim(s) 6-8 and 11-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 5, 27 and 30-32 is/are allowed.
- 6) ☒ Claim(s) 3, 4, 19-22, 24, 25 and 33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is a Final Rejection for application no. 09/552,761 in response to the amendment filed on February 13, 2006 where in claims 3-5, 19-22, 24, 25, 27, 30-33 are presented for examination.

Response to Arguments

Applicant's arguments filed February 13, 2006 have been fully considered but they are not persuasive.

In regards to the applicant's arguments related to claim 3, the applicant states Uz teaches the "total activity value TA_j in the cited portion refers to a plurality of frames of a scene" and the power value of claim 3 is for "a first frame". Uz teaches the average of TA_j is set to the value of TA_j for the first frame (Col 11 Lines 50-55). Further, the TA_j value is used to determine a scene change (Col 11 Lines 32-37). Based on this scene change determination the number of bits in a second frame are adjusted (Col 11 Lines 38-49). Note that the second frames adjustment is based on the power value, which does not require the adjustment to be sole based on the power value of the first frame. Therefore the TA_j which contains the total activity of the first frame satisfies the broad requirements of claim 3.

In regards to claim 19, the applicant argues that TA_j can not be a power value and a global complexity history value. The applicant further argues that Uz does not teach a prediction error image. Claim 19 does not require the use of both a power value and a global complexity history value. As noted in the previous Office Action, the applicant states (on page 27) the power value is fully based on complexity. Uz teaches

the variable TA_i is the average total activity for the frames of a scene. Therefore TA_i is both a power value and a global complexity history value. Uz further teaches the scene change indication reset TA_i (Col 11 Lines 53-56). The predication error image is viewed by the examiner to be equivalent to the sum of absolute differences of the pixels in the macroblocks taught by Uz (Col 11 Lines 24-32).

In regards to claim 21, the applicant argues that Uz does not teach an adjustment of sizes of non-intra frames based on expected sizes of future intra frames. As cited on Col 11 Lines 41-48, Uz teaches providing a budget for B and P frames based on an initial I-frame. As the claim does not require a specific method for controlling the adjustment of sizes of non-intra frames based on expected sizes of future intra frames, the use of setting the budgets to a default value at a scene change is viewed by the examiner to satisfy the requirements of adjusting the sizes based on expected sizes of future intra frames. One would expect future intra frames to have the same size as the first intra frame of a scene as they would be in the same scene thus containing similar image data.

In regards to claim 20, the applicant argues that Uz and Kuchibhotla do not teach the claimed scene change detection. Kuchibhotla teaches the scene change detection method where in the number of intra-coded and non-intra coded blocks is counted and a ration of the first number and second number (percentage of I coded macroblocks) is compared to a threshold (Col 3 Line 50-Col 4 Line 5). Both Uz and Kuchibhotla teach the need to prevent exceeding a coding bit budget and the detection of scene changes,

therefore it would have been obvious to use the method of Kuchibhotla with the method of Uz as an alternative means to determining a scene change.

In regards to the arguments related to claims 24 and 25, the applicant argues the Examiners statement that it would have been obvious to divide the method into sub-routines for a computer system to run the method. As stated in the previous Office Action, Chiang teaches the use of a general purpose computer (Col 11 Line 58-Col 12 Line 8, Fig. 7). A general purpose computer is a well known advancement to a specialty apparatus as a general purpose computer can perform sub-routines to perform the same tasks as the specialty apparatus but is easier to upgrade. Therefore since Chiang teaches the use of a general purpose computer to perform the sub-routines of Figure 4, it would have been obvious to one of ordinary skill in the art to perform the same tasks using a specialty apparatus containing blocks as a design choice.

It is noted by the Examiner that the Applicant did not respond to the 35 U.S.C. 102 rejection of claim 3 by US Patent 5,241,383 to Chen et al. from the Office Action mailed September 8, 2005.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 33 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

[claim 33]

The claim requires “obtaining a prediction error frame including a plurality of pixel-level error values and L1 distances” this is not supported by the specification. The specification states the prediction error frame contains a plurality of pixel-level error values (Page 11 Lines 1-2) and L1 distances are provided after a calculation (Page 7 Line 30-Page 8 Line 2). Therefore there is no support for a “prediction error frame including a plurality of pixel-level error values and L1 distances”. Further the claim requires “using a group-of-pictures-level prediction for a number of bits encoded for a group-of-pictures, a picture-level prediction for a number of bits encoded for a picture, a pixel-block-level prediction for a number of bits encoded for a pixel block, the L1 distances and the picture-level rate control to obtain a pixel-block-level rate control for the video encoder” is not supported by the elected Figures 1-5 and 9. At best, the specification supports the method as disclosed, on page 9 lines 4-14, for obtaining a pixel-block-level rate control.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 3 is rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,535,251 to Ribas-Corbera.

[claim 3]

As shown in Figure 6, Ribas-Corbera teaches the quantization step size is based on the calculated power values from a previous frame (step 140, Fig. 6) (Col 4 Lines 35-53, Col 6 Lines 18-30).

Claims 3, 19, 21, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,686,963 to Uz et al.

[claim 3]

Uz teaches the use of a power value (total activity (TA)) for a first frame used to adjust the bits for a second frame (Col 11 Lines 11-50). As shown by the citation, Uz teaches the bits for a second frame are set to a default when a Scene Change is detected (Col 11 Lines 40-50). The scene change is determined based on the TA value (Col 11 Lines 22-37). Note, TA was equated to meet the power limitation. Applicant's own specs (page 27) appears to teach that power is fully based on complexity. Thus, the TA meets the power limitation.

[claim 19]

Uz describes the detection of a scene change using a prediction error image and using the scene change to reset the global complexity history TA_i (Col 11 Lines 50-56). TA_i is used to provide the rate control (rate control quantization scale factor) for the video encoder (Col 11 Line 61-Col 12 Line 10). (Col 11 Line 10-Col 12 Line 10).

[claims 21 and 22]

Uz teaches in figure 1a, the apparatus for rate control for a constant-bit-rate finite-buffer-size video encoder comprising a preprocessing stage (20) for determining a power value (TA) (Col 8 Lines 32-67, Col 9 Lines 1-10) and a group-of-pictures-level rate control block (30) operatively coupled to the preprocessing stage to receive the power value and to provide a target quantizer step size used to provide rate control for the video encoder (Col. 11 Lines 12-67 and Col. 12 Lines 1-9). Uz teaches the non-intra frames having sizes based on the expected size of the future intra frames (Col. 11 Lines 41-49). Therefore Uz satisfies the requirements of claim 21. Further, Uz teaches the updating of the power value for each subsequent picture being encoded as required by claim 22 (Col. 8 Lines 33-35).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uz as applied to claim 3 above, and further in view of US Patent 6,226,326 to Mihara.

[claim 4]

Uz's TA variable is a sum of the total activities (sum of the absolute differences of pixel blocks) for all the macroblocks in a frame (Col 8 Lines 51-64). The controller maintains an average TA for the frames of a scene (Col 11 Lines 17-18). Uz does not

teach how to calculate the average. Mihara teaches the steps for calculating the power value by calculating a sum of absolute differences between the pixel values in the respective pixel block and the average value. The values are added for each of the plurality of pixel blocks within the first frame to obtain a power value for the first frame (Col 19, Lines 10-20). It would have been obvious to one skilled in the art at the time of the invention to calculate the average for each block or each frame as as taught by Mihara in order to obtain the energy value of the frame.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uz as applied to claim 19 above, and further in view of US Patent 5,724,100 to Kuchibhotla and 'Hierarchical Scene Change Detection in an Mpeg-2 Compressed Video Sequence' to Shin et al.

[claim 20]

Uz teaches the use of a method for rate control that obtains a scene change indication from a prediction error image and using the scene change indication to reset a global complexity history and using the global complexity history to provide the rate control for the video encoder. Uz does not teach the method of counting a first number of intra coded pixel blocks in the prediction error image, counting a second number of non-intra coded pixel blocks in the prediction error image, calculating a ratio of the first number and the second number, comparing the ratio to a threshold to determine a result and using the result as a scene change indication. Kuchibhotla does teach this method as a means to prevent exceeding a coding bit budget (Col 2 Lines 35-58, Col 3 Line 53-Col 4 line 5). It would have been obvious to one skilled in the art at the time of

the invention to use the method of Uz in conjunction with the method of Kuchibhotla in order to prevent exceeding a coding bit budget.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,690,833 to Chiang et al.

[claim 24]

As shown in Figure 4, Chiang teaches a method for rate control wherein the method provides a means for determining the distance according to sums of absolute differences (step 410). Chiang further teaches the use of the distance to produce a target quantizer step size for a pixel block (steps 420-440) (Col 8 Lines 27-Col 10 Line 12). Chiang further teaches the use of a computer system to perform the encoding steps (Col 11 Line 58-Col 12 Line 8, Figure 7). Chiang does not teach the specific prediction error image block and picture-level rate control block. It would have been obvious to one of ordinary skill in the art at the time of the invention to divide the method of Chiang into any desired subroutines (blocks) in order for the method to be run by the system of Chiang as it is well known in the art to provide a program with subroutines to perform tasks in order to easily replace or update functions in the program.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang as applied to claim 24 above, and further in view of US Patent 5,724,100 to Kuchibhotla [claim 25]

Chiang teaches the apparatus of claim 24 as shown above. Chiang further teaches the complexity value (MAD) determining means for all pixel blocks (Col 8 Lines 48-54). Although Chiang fails to teach the determining of intra vs non-intra blocks,

Art Unit: 2621

Kuchibhotla does teach the determining of intra vs non-intra blocks (Fig. 1 element 134, Col 3 Line 30-Col 4 Line 5). Kuchibhotla further teaches the benefit of half-pel motion estimation to obtain a correct scene change detection (Col 4 Line 64-Col 5 Line10). Since both systems provide constant-bit-rate it would have been obvious to one skilled in the art at the time of the invention to substitute Kuchibhotla's scene change detector into the system of Chiang since the scene change detector of Kuchibhotla has the advantage of accurately detecting scene change for half pixel motion compensation.

Allowable Subject Matter

Claims 5, 27, 30-32 are allowed.

Conclusion

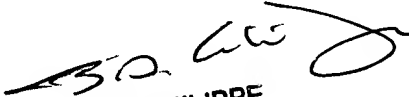
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erick Rekstad whose telephone number is 571-272-7338. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on 571-272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2621

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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